

● PRINTER RUSH ●
(PTO ASSISTANCE)

Application :	10/705318	Examiner :	TON
From:	MR	Location:	(IDC) FMF FDC
		GAU :	
		2871	
		Date:	
		05-25-05	
		Tracking #:	04096298
		Week Date:	
		04-18-05	

DOC CODE	DOC DATE	MISCELLANEOUS
<input type="checkbox"/> 1449		<input type="checkbox"/> Continuing Data
<input type="checkbox"/> IDS		<input checked="" type="checkbox"/> Foreign Priority
<input type="checkbox"/> CLM		<input type="checkbox"/> Document Legibility
<input type="checkbox"/> IIFW		<input type="checkbox"/> Fees
<input type="checkbox"/> SRFW		<input type="checkbox"/> Other
<input type="checkbox"/> DRW		
<input type="checkbox"/> OATH		
<input type="checkbox"/> 312		
<input type="checkbox"/> SPEC		

[RUSH] MESSAGE: (1) Foreign Priority (EPD 99202351.5) claim
is over the 1 year filing date of this application.

Please advise.

Thank you.

[XRUSH] RESPONSE:

PCT information corrects above.
See new lib sheet and amendment
to p. 1 of specification.

INITIALS: *JBH*

NOTE: This form will be included as part of the official USPTO record, with the Response document coded as XRUSH.

REV 10/04

JB
5-31-05
Liquid crystal display device

CROSS REFERENCE TO RELATED APPLICATIONS

This is a divisional application Ser. No. 09/787249, filed Mar. 16, 2001, which is a 371 of PCT/EP00/06587, filed July 11, 2000.

The invention relates to a liquid crystal display device having, between a polarizer and an analyzer, a first layer of twisted liquid crystal material with a twisted structure between two transparent substrates, with pixels being realized between the substrates, and a compensator layer. Such display devices are generally used in, for example, 5 automotive displays, but also in monitors, etc.

An example of such a display device is shown in, for example, USP 5,287,207. This patent shows a double cell in which a second cell functions as a compensator in order to obtain an optimum contrast. Although a satisfactory contrast is obtained in these 10 types of display devices upon perpendicular passage of the light, it appears that there is a considerable grey scale inversion in such a double cell, when viewed at an angle.

It is, inter alia, an object of the present invention to reduce or eliminate said grey scale inversion.

15 To this end, a display device according to the invention is characterized in that a pixel comprises at least two sub-pixels having the same twist and, viewed transversely to the substrates, twist angles which are rotated with respect to each other. The twist angles, viewed transversely to the substrates, are rotated substantially 180 degrees with respect to each other. The effects on the grey scale of one sub-pixel are then compensated, as it were, 20 by the effects of the other sub-pixel. Also in the case of rotations different from 180 degrees, an enhancement is obtained dependent on the type of usage (for example, in cockpit applications or in applications where a display device is viewed by different persons from two directions).

The twist angles are preferably in the range between 50 and 100 degrees.

25 A first preferred embodiment of a liquid crystal display device according to the invention is characterized in that the compensator layer has a twisted structure with a twist which is opposite to that of the layer of twisted liquid crystal material. The compensator layer preferably has a twist angle which is opposite to that of the layer of twisted liquid crystal material.



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Bib Data Sheet

CONFIRMATION NO. 4463

SERIAL NUMBER 10/705,318	FILING OR 371(c) DATE 11/10/2003 RULE	CLASS 349	GROUP ART UNIT 2871	ATTORNEY DOCKET NO. PHN17,537A
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APPLICANTS

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**** CONTINUING DATA *******

This application is a DIV of 09/787,249 03/16/2001 PAT 6,674,498 *
 which is a 371 of PCT/EP00/06587 07/11/2000

(*Data provided by applicant is not consistent with PTO records.

**** FOREIGN APPLICATIONS *******

EUROPEAN PATENT OFFICE (EPO) 99202351.5 07/16/1999

IF REQUIRED, FOREIGN FILING LICENSE GRANTED

** 02/12/2004

Foreign Priority claimed	<input type="checkbox"/> yes <input type="checkbox"/> no	STATE OR COUNTRY NETHERLANDS	SHEETS DRAWING 5	TOTAL CLAIMS 3	INDEPENDENT CLAIMS 1
35 USC 119 (a-d) conditions met	<input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> Met after Allowance				
Verified and Acknowledged	Examiner's Signature	Initials			

ADDRESS

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TITLE

LIQUID CRYSTAL DISPLAY DEVICE

FILING FEE RECEIVED 1070	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:	<input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees (Filing) <input type="checkbox"/> 1.17 Fees (Processing Ext. of time) <input type="checkbox"/> 1.18 Fees (Issue) <input type="checkbox"/> Other _____ <input type="checkbox"/> Credit
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